

REMARKS

Reconsideration of this application, as amended, is respectfully requested.

Claims 1, 3-25, 27-49, 51-73, 75-97, 99, 101, 103, 105, 107, 109, and 111 are pending. Claims 1, 3-15, 17-25, 27-39, 41-49, 51-63, 65-73, 75-87, 89-97, 99, 101, 103, 105, 107, 109, and 111 have been rejected. Claims 16, 40, 64, and 88 have been objected to.

Claims 1, 25, 49, 73, 97, 101, 105, and 109 have been amended. No claims have been canceled. No claims have been added. Support for the amendments is found in the specification, the drawings, and in the claims as originally filed. Applicant submits that the amendments do not add new matter.

Applicant reserves all rights with respect to the applicability of the Doctrine of Equivalents.

Applicant acknowledges with appreciation the Examiner's indication of allowance of claims 16, 40, 64, and 88 if re-written in independent form including all limitations of the base claim and any intervening claims.

Claims 1, 3-8, 19-20, 25, 27-32, 43-44, 49, 51-56, 67-68, 73, 75-80, 91-92, 97, 99, 101, 103, 105, 107, 109, and 111 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,665,641 to Coorman et al. ("Coorman") in view of Banbrook "Nonlinear Analysis of Speech From a Synthesis Perspective" ("Banbrook").

Amended claim 1 reads as follows:

A machine-implemented method comprising:

extracting portions from speech segments, the portions surrounding a segment boundary within a phoneme;
identifying time samples from the portions;
constructing a matrix W containing the time samples from the portions surrounding the segment boundary within the phoneme; and deriving feature vectors that represent the portions in a vector space by decomposing the matrix W containing the time samples from the portions surrounding the segment boundary within the phoneme, such that at least phase information of the portions is preserved in the feature vectors; and
determining a distance between the feature vectors in the vector space.

(emphasis added)

The Examiner acknowledged that “Coorman fails to...disclose.. features include phase information of the portions, ... and wherein creating feature vectors comprises constructing a matrix W from the portions...”(Office Action, p. 4, 01/25/08).

Accordingly, Coorman also fails to disclose deriving feature vectors that represent the portions of the speech segments in a vector space by decomposing the matrix W containing the time samples from the portions surrounding the segment boundary within the phoneme, such that at least phase information of the portions is preserved in the feature vectors, as recited in amended claim 1.

Banbrook, in contrast, discloses the time series embedding method that “takes no account of noise”(37, chapter 4.1, paragraphs 1-3). More specifically, Banbrook discloses that “ the method of singular value decomposition reduction...addresses this problem. The data is projected onto a phase space defined by the singular vectors of the data, which can then be partitioned into a signal subspace and a noise subspace”. (p. 37, paragraph 3).

Thus, Banbrook discloses the method of singular value decomposition. In contrast, amended claim 1 refers to deriving feature vectors that represent the portions in

a vector space by decomposing the matrix *W* containing the time samples from the portions surrounding the segment boundary within the phoneme, such that at least phase information of the portions is preserved in the feature vectors.

Thus, neither Banbrook, nor Coorman discloses, teaches, or suggest such limitations of amended claim 1.

Furthermore, even if Banbrook and Coorman were combined, such a combination would still lack deriving feature vectors that represent the portions of the speech segments in a vector space by decomposing the matrix *W* containing the time samples from the portions surrounding the segment boundary within the phoneme, such that at least phase information of the portions is preserved in the feature vectors, as recited in amended claim 1.

Therefore, applicant respectfully submits that claim 1, as amended, is not obvious over Coorman, in view of Banbrook under 35 U.S.C. § 103(a).

Given that claims 3-8, 19-20, 25, 27-32, 43-44, 49, 51-56, 67-68, 73, 75-80, 91-92 contain the limitations that are similar to those discussed with respect to amended claim 1, applicant respectfully submits that claims 3-8, 19-20, 25, 27-32, 43-44, 49, 51-56, 67-68, 73, 75-80, 91-92 are not obvious over Coorman, in view of Banbrook under 35 U.S.C. § 103(a).

Amended claim 97 reads as follows:

A machine-implemented method comprising:

gathering time-domain samples from recorded speech segments, wherein the time-domain samples include time samples of pitch periods surrounding a segment boundary within a phoneme;

constructing a matrix containing the time samples of the pitch periods surrounding the segment boundary within the phoneme and deriving feature vectors that represent the time samples in a vector space by decomposing the matrix containing the

time samples of the pitch periods surrounding the segment boundary within the phoneme, such that at least phase information of the time samples is preserved in the feature vectors;

determining a discontinuity between the segments, the discontinuity based on a distance between the features.

(emphasis added)

As set forth above, neither Coorman, nor Banbrook discloses, teaches, or suggests deriving feature vectors that represent the time samples in a vector space by decomposing the matrix containing the time samples of the pitch periods surrounding the segment boundary within the phoneme, such that at least phase information of the time samples is preserved in the feature vectors, as recited in amended claim 97.

Furthermore, even if Coorman and Banbrook were combined, such a combination would still lack such limitations of amended claim 97.

Therefore, applicant respectfully submits that claim 97, as amended, is not obvious over Coorman, in view of Banbrook under 35 U.S.C. § 103(a).

Given that claims 99, 101, 103, 105, 107, 109, and 111 contain the limitations that are similar to those discussed with respect to amended claim 97, applicant respectfully submits that claims 99, 101, 103, 105, 107, 109, and 111 are not obvious over Coorman, in view of Banbrook under 35 U.S.C. § 103(a).

Claims 9-10, 21-23, 33-34, 45-47, 57-58, 69-71, 81-82 and 93-95 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Coorman in view of Banbrook and in further view of Ansari et al., “Pitch Modification of Speech Using a Low-Sensitivity Inverse Filter Approach” (“Ansari”).

Ansari, in contrast, discloses pitch modification of speech using a low-sensitivity inverse filter approach, and also fails to disclose the discussed above limitations of amended claim 1 or amended claim 97.

Therefore, for at least the same reasons as set forth with respect to amended claims 1, or 97, applicant respectfully submits that claims 9-10, 21-23, 33-34, 45-47, 57-58, 69-71, 81-82 and 93-95 are not obvious under 35 U.S.C. § 103(a) over Coorman, in view of Banbrook, and further in view of Ansari.

Claims 11-15, 35-39, 59-63 and 83-86 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Coorman and Banbrook in view of Ansari and in further view of Bellegarda, “Exploiting Latent Information in Statistical Language Modeling” (“Bellegarda”).

Bellegarda also fails to disclose the discussed above limitations of amended claims 1 or 97.

Therefore, for at least the same reasons as set forth with respect to amended claims 1, or 97, applicant respectfully submits that claims 11-15, 35-39, 59-63 and 83-86 are not obvious under 35 U.S.C. § 103(a) over Coorman, in view of Banbrook, in view of Ansari, and further in view of Bellegarda.

It is respectfully submitted that in view of the amendments and arguments set forth herein, the applicable rejections and objections have been overcome. If there are any additional charges, please charge Deposit Account No. 022666.

Respectfully submitted,
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